

# ExoMars: The Enhanced Baseline Mission

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ExoMars is the first mission of the ESA Exploration Programme - Aurora. The mission will demonstrate the feasibility of several key technologies that are necessary to support the European ambitions for future human exploration:

- Entry and Descent of a large re-entry capsule (1200 kg) and Landing (EDL) of a payload of about 600 Kg on the Mars surface
- Surface mobility via a Rover (250 kg) having several kilometres of mobility range
- Access to sub-surface via a Drill, mounted in the Rover, to acquire samples down to 2 meters.
- Automatic sample preparation and distribution for analyses of scientific experiments.

Two sets of scientific payloads will be brought to Mars with the following objectives:

- Establish whether life ever existed or still exists on Mars (tight control of the bio-burden exported to Mars)
- Characterize the Mars geochemistry and water distribution
- Improve the knowledge of the Mars environment and geophysics
- Identify possible surface hazards to future human exploration missions.

The mission configuration, named Enhanced Baseline Mission, foresees the launch of a Spacecraft Composite (SC) by means of an Ariane 5 launcher lifting from Kourou. An optimal launch window has been established from November 23rd to December 13th 2013.

The mission and the SC will be designed to be compatible with a back-up launcher, Proton -M from Baikonur.

An alternative launch date is foreseen, in January 2016.

The SC Composite is formed by a Carrier Module (CM) and a Descent Module Composite (DMC), consisting of the Descent Module (DM) housing the Rover Module (RM). The total mass at launch is about 4550 kg.

The mission is an enhanced version of the original baseline as it still foresees:

- Expandable Carrier that will break and burn up in the Mars atmosphere after releasing the DM.
- Use of a NASA Relay Orbiter for the communications from/to Mars

However the Rover mission is significantly enhanced:

- Rover mass is now raised to 250 kg to accommodate all the scientific instruments of the Pasteur Payload (PPL)
- The stationary scientific payload, Humboldt Payload (HPL - formerly GEP) is definitely baselined as part of the Lander.

The PFM campaign will be completed within February 2013 with the Flight Acceptance Review which authorises the SC shipment to Korou for the starting of the launch campaign.

The Flight Readiness Review is placed mid November 2013: the optimal 21-days launch window will last from 23rd November to 13th December 2013.